UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/765,539	01/19/2001	Hyung-joon Kwon	8021-28 (SS-14984-US)	1424

7590 07/23/2003

Frank Chau, Esq.
F. CHAU & ASSOCIATES, LLP
Suite 501
1900 Hempstead Turnpike
East Meadow, NY 11554

EXAMINER	
TORRES, JOSEPH D	
ART UNIT	**PAPER NUMBER**
2133	5

DATE MAILED: 07/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/765,539	KWON, HYUNG-JOON	
	Examiner	Art Unit	
	Joseph D. Torres	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☒ Claim(s) *9-11 and 14-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 January 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3,4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: '610', '635', and '653' in Figure 6. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 2 is objected to because of the following informalities: Claim 2 cites, "each the erasure symbols is one of the information data symbols". The examiner recommends the following language to correct minor grammatical informalities: each **of** the erasure symbols is one of the information data symbols.

Claims 9-11 and 14-16 are objected to because of the following informalities: Claim 9 cites, "a means for detecting a code word having errors more than a predetermined number". The examiner recommends the following language to correct minor grammatical informalities: a means for detecting a code word having more than a predetermined number of errors.

Claims 10 and 11 depend from claim 9; hence inherit the deficiencies in claim 9.

Claim 14 cites similar language as in claim 9.

Claims 15 and 16 depend from claim 14; hence inherit the deficiencies in claim 14.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3 and 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Howe, Dennis George et al. (US 6112324 A, hereafter referred to as Howe).

35 U.S.C. 102(e) rejection to claim 1.

Howe teaches a method for channel decoding and error correcting modulated data reproduced from an optical disc (Figure 3 in Howe is a device for channel decoding EFM modulated channel coded data and error correcting the EFM modulated channel coded data reproduced from the optical CD disc of Figure 1 in Howe) comprises the steps of: a. setting a channel code including channel data patterns of channel data symbols and information data symbols which correspond to respective channel data patterns (col. 15, lines 10-14, Howe; Note: Howe teaches that EFM modulation is inherently a means for setting an EFM channel code including 256 channel data

patterns of 14-bit channel data symbols and 8-bit information data symbols which correspond to respective 14-bit channel data patterns); b. producing demodulated data including the information data symbols and erasure flags by demodulating the channel data symbols, using the channel code (col. 8, lines 42-48, Howe: Note: Howe teaches that during EFM demodulation erasure flags are produced to flag erroneous information data, hence Howe teaches producing EFM demodulated data including the 8-bit information data symbols and EFM erasure flags by EFM demodulating the 14-bit channel data symbols); and c. performing error-erasure correction on the information data symbols produced in the step b (col. 16, lines 13-16, Howe; Note: Howe teaches the erasure flags are used to perform error-erasure correction on the information data symbols associated with the erasure flags), using error locations indicated by the erasure flags having a predetermined value (col. 8, lines 48-51, Howe; Note: Howe teaches that erasure flag information is written to RAM by flagging individual bytes, hence the location of the errors is indicated), wherein the step b of producing demodulated data comprises the steps of; outputting the information data symbols if the channel code has the information data symbols corresponding to the channel data patterns; and outputting erasure symbols as the information data symbols and setting the erasure flags to the predetermined value if the channel code has no information data symbols corresponding to the channel data patterns (col. 8, lines 42-51, Howe; Note: Howe teaches that the EFM demodulator outputs information data symbols, if the channel code has the information data symbols corresponding to the channel data patterns, i.e., if no code violations are detected, and if code violations are detected,

erasure symbols are flagged and outputted to be deleted by the C1 decoder, hence Howe teaches outputting the information data symbols, if the channel code has the information data symbols corresponding to the channel data patterns and outputting erasure symbols as the information data symbols and setting the erasure flags to the predetermined value, if the channel code has no information data symbols corresponding to the channel data patterns).

35 U.S.C. 102(e) rejection to claim 2.

In col. 8, lines 42-51, Howe teaches that if code violations are detected, erasure symbols are flagged and outputted to be deleted by the C1 decoder, hence each of the erasure symbols is one of the information data symbols in the channel code.

35 U.S.C. 102(e) rejection to claim 3.

Figure 3 in Howe is a device for channel decoding EFM modulated channel-coded data and error correcting the EFM modulated channel-coded data reproduced from the optical CD disc of Figure 1 in Howe.

35 U.S.C. 102(e) rejection to claim 5.

Howe teaches system for channel decoding and error correcting modulated data reproduced from an optical disc (Figure 3 in Howe is a system for channel decoding EFM modulated channel coded data and error correcting the EFM modulated channel coded data reproduced from the optical CD disc of Figure 1 in Howe) comprises: a

channel decoder (EFM demodulator 54 in Figure 3 of Howe is a channel decoder), including a channel code having channel data patterns that channel data symbols can have and information data symbols which correspond individually to the channel data patterns (col. 15, lines 10-14, Howe; Note: Howe teaches that EFM modulation is inherently a means for setting an EFM channel code including 256 channel data patterns of 14-bit channel data symbols and 8-bit information data symbols which correspond to respective 14-bit channel data patterns), and for producing demodulated data having the information data symbols and erasure flags by demodulating the channel data symbols, using the channel code (col. 8, lines 42-48, Howe: Note: Howe teaches that during EFM demodulation erasure flags are produced to flag erroneous information data, hence Howe teaches producing EFM demodulated data including the 8-bit information data symbols and EFM erasure flags by EFM demodulating the 14-bit channel data symbols), a memory for storing the demodulated data outputted from the channel decoder (16K X4 External Ram 52 in Figure 3 of Howe is a memory for storing the demodulated data outputted from the channel decoder); and a decoding unit for performing an error-erasure correction on the information data symbols (C1 Decoder 58 in Figure 3 of Howe is a decoding unit for performing an error-erasure correction on the information data symbols), using error locations indicated by the erasure flags having a predetermined value (col. 8, lines 48-51, Howe; Note: Howe teaches that erasure flag information is written to RAM by flagging individual bytes, hence the location of the errors is indicated), wherein the channel decoder outputs the information data symbols if the channel code has the information data symbols corresponding to the channel data

patterns, and the channel decoder outputs erasure symbols as the information symbols and sets the erasure flags to the predetermined value if the channel code has no information data symbols corresponding to the channel data patterns (col. 8, lines 42-51, Howe; Note: Howe teaches that the EFM demodulator outputs information data symbols, if the channel code has the information data symbols corresponding to the channel data patterns, i.e., if no code violations are detected, and if code violations are detected, erasure symbols are flagged and outputted to be deleted by the C1 decoder, hence Howe teaches outputting the information data symbols, if the channel code has the information data symbols corresponding to the channel data patterns and outputting erasure symbols as the information data symbols and setting the erasure flags to the predetermined value, if the channel code has no information data symbols corresponding to the channel data patterns).

35 U.S.C. 102(e) rejection to claim 6.

In col. 8, lines 42-51, Howe teaches if code violations are detected, erasure symbols are flagged and outputted to be deleted by the C1 decoder, hence each of the erasure symbols is one of the information data symbols in the channel code.

35 U.S.C. 102(e) rejection to claim 7.

Figure 3 in Howe is a device for channel decoding EFM modulated channel-coded data and error correcting the EFM modulated channel-coded data reproduced from the optical CD disc of Figure 1 in Howe.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 4, 8, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howe, Dennis George et al. (US 6112324 A, hereafter referred to as Howe).

35 U.S.C. 103(a) rejection of claims 4 and 8.

Howe, substantially teaches the claimed invention described in claims 1-3 (as rejected above). In addition, Howe teaches an embodiment whereby a single-nibble erasure flag is used to mark a double-nibble erasure (col. 27, lines 38-40, Howe).

However Howe, does not explicitly teach the specific use of a 1-bit erasure flag to mark an 8-bit erasure.

The Examiner asserts that modifying the embodiment in Howe to produce another embodiment to increase or decrease error-correcting capabilities does not deviate from the scope or the intent of the teachings in the Howe patent. One of ordinary skill in the art at the time the invention was made would have been motivated to modify the Howe patent based on error correction requirements of a particular application (Note: a nibble sized flag inherently provids more information allowing for correction of multiple portions within the double-nibble information data).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Howe by including use of a 1-bit erasure flag to mark an 8-bit erasure. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a 1-bit erasure flag to mark an 8-bit erasure would have provided the opportunity to increase or decrease error-correcting capabilities based on error correction requirements of a particular application (Note: a nibble sized flag inherently provides more information allowing for correction of multiple portions within the double-nibble information data).

35 U.S.C. 103(a) rejection of claim 12.

Howe teaches a method for correcting errors and erasures in modulated channel data reproduced from an optical disc (Figure 3 in Howe clearly suggests a method for channel decoding EFM modulated channel coded data and error correcting the EFM modulated channel coded data reproduced from the optical CD disc of Figure 1 in

Howe), comprising the steps of: providing a channel code having channel data patterns of the modulated channel data and information data symbols corresponding to the channel data patterns, respectively (col. 15, lines 10-14, Howe; Note: Howe teaches that EFM modulation is inherently a means for setting an EFM channel code including 256 channel data patterns of 14-bit channel data symbols and 8-bit information data symbols which correspond to respective 14-bit channel data patterns); comparing channel data symbols of the modulated channel data with the channel data patterns in the channel code (col. 8, lines 42-51, Howe; Note: Howe teaches that that the EFM demodulator outputs information data symbols, if the channel code has the information data symbols corresponding to the channel data patterns, i.e., if no code violations are detected, and if code violations are detected, erasure symbols are flagged and outputted to be deleted by the C1 decoder, which clearly suggests a means for ensuring channel data symbols of the modulated channel data match with the channel data patterns in the channel code); producing information data symbols corresponding to channel data patterns of the channel data symbols to form demodulated data; producing erasure symbols with erasure flags to form the demodulated data when the channel code has no channel data patterns matching the channel data symbols; providing code words obtained from the demodulated data; and correcting errors and erasures in the code words using the erasure flags (col. 8, lines 42-51, Howe; Note: Howe teaches that the EFM demodulator outputs information data symbols, if the channel code has the information data symbols corresponding to the channel data patterns, i.e., if no code violations are detected, and if code violations are detected, erasure symbols are flagged

and outputted to be deleted by the C1 decoder, hence Howe teaches outputting the information data symbols, if the channel code has the information data symbols corresponding to the channel data patterns and outputting erasure symbols as the information data symbols and setting the erasure flags to the predetermined value, if the channel code has no information data symbols corresponding to the channel data patterns).

35 U.S.C. 103(a) rejection of claim 13.

Figure 3 in Howe is a device for channel decoding EFM modulated channel-coded data and error correcting the EFM modulated channel-coded data reproduced from the optical CD disc of Figure 1 in Howe. Using the teachings of the Howe patent in a DVD/EFM+ environment does not deviate from the scope or the intent of the teachings in the Howe patent since all of the same structural elements of the CD/EMF environment can be used in the DVD/EFM+ environment.

5. Claim 9-11 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howe, Dennis George et al. (US 6112324 A, hereafter referred to as Howe) in view of Rhines, Don S. et al. (US 5392299 A, hereafter referred to as Rhines).

35 U.S.C. 103(a) rejection of claims 9 and 14.

Howe, substantially teaches the claimed invention described in claims 1-8 (as rejected above). In addition, Howe teaches a means for receiving from the memory code words

obtained from the demodulated data (the System in Figure 3 provides a means for receiving from the RAM memory 52, code words obtained from the EFM Demodulator 58); a means for detecting a code word having more than a predetermined number of errors (C1 Decoder 58 in Figure 3 of Howe is a means for detecting a code word having more than a predetermined number of errors); and a means for providing second flags of a predetermined value to information data symbols of the detected code word (col. 8, lines 60-67, Howe, Note: Howe teaches that the C1 decoder produces a second flag for indicating the reliability of data).

However Howe, does not explicitly teach that the second flag is an erasure flag.

Rhines, in an analogous art, teaches serially concatenated decoders whereby each decoder produces erasure flags for use by a subsequent decoder stage (col. 2, lines 39-42, Rhines). Rhines teaches that the erasure flags assist in the correction of data (col. 2, lines 42-45, Rhines).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Howe with the teachings of Rhines by including use of a second erasure flag. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of a second erasure flag would have provided the opportunity to improve error correction capabilities since the erasure flags assist in the correction of data (col. 2, lines 42-45, Rhines).

35 U.S.C. 103(a) rejection of claim 10.

The Examiner asserts that modifying the embodiment in Howe and Rhines to produce another embodiment to increase or decrease error-correcting capabilities does not deviate from the scope or the intent of the teachings in the Howe and Rhines patents.

35 U.S.C. 103(a) rejection of claim 11.

Howe teaches a means for deinterleaving data from the decoding unit to generate deinterleaved code words containing the information data symbols and the second erasure flags (see Inner De-Interleaver 190 in Figure 2 of Rhines); and a second decoding unit for performing error-erasure correction on the information data symbols of the deinterleaved code words using the second erasure flags (see Middle Decoder 202 in Figure 2 of Rhines).

35 U.S.C. 103(a) rejection of claim 15.

In col. 27, lines 36-40, Howe teaches that the erasure flags are provided to the detected code word such that each of the erasure flags is attached to each of information data symbols or erasure symbols of the detected code word.

35 U.S.C. 103(a) rejection of claim 16.

Howe teaches a means for deinterleaving data from the decoding unit to generate deinterleaved code words containing the information data symbols and the second erasure flags (see Inner De-Interleaver 190 in Figure 2 of Rhines); and a second

decoding unit for performing error-erasure correction on the information data symbols of the deinterleaved code words using the second erasure flags (see Middle Decoder 202 in Figure 2 of Rhines).

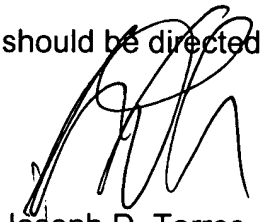
Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kelly, John J. (US 6557126 B1) teaches optical disk systems eight-to-fourteen modulation (EFM).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (703) 308-7066. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-746-7240.



Joseph D. Torres
Art Unit 2133
July 21, 2003